



Australian Government

UEEEEC0018 Develop engineering solutions to audio electronic problems

Release: 1

UEEEEC0018 Develop engineering solutions to audio electronic problems

Modification History

Release 1. This is the first release of this unit of competency in the UEE Electrotechnology Training Package.

Application

This unit involves the skills and knowledge required to develop engineering solutions to audio electronic problems.

It includes developing engineering solutions to resolve problems with audio electronics. It also includes working safely, gathering and analysing data, applying problem-solving techniques, and developing and documenting solutions and alternatives.

Typical audio electronic problems are those encountered in meeting performance requirements and compliance standards, revising audio electronic operating parameters and dealing with audio electronic malfunctions.

The skills and knowledge described in this unit require a licence or permit to practice in the workplace where work is carried out on electrical installations which are designed to operate at voltages greater than 50 volt (V) alternating current (a.c.) or 120 V direct current (d.c.).

Competency development activities in this unit are subject to regulations directly related to licensing. Where a licence or permit to practice is not held, skills and knowledge described in this unit require a relevant contract of training, such as an Australian Apprenticeship.

Additional and/or other conditions may apply in some jurisdictions subject to regulations related to electrical work. Practice in the workplace and during training is also subject to work health and safety (WHS)/occupational health and safety (OHS) regulations.

Permits may also be required for some work environments, such as confined spaces, working aloft, near live electrical apparatus and site rehabilitation.

No other licensing, legislative or certification requirements apply to this unit at the time of publication.

Pre-requisite Unit

UEEEEC0067 Troubleshoot basic amplifier circuits

Competency Field

Electronics and Communications

Unit Sector

Electrotechnology

Elements and Performance Criteria

ELEMENTS

Elements describe the essential outcomes.

PERFORMANCE CRITERIA

Performance criteria describe the performance needed to demonstrate achievement of the element.

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|---|---|
| 1 Identify audio electronic problems | 1.1 WHS/OHS requirements and workplace procedures for a given work area are identified and applied

1.2 WHS/OHS risk control measures and workplace procedures are followed in preparation for the work

1.3 Extent of the audio electronic problem is determined from performance specifications, situation reports and in consultation with relevant person/s

1.4 Activities are planned to meet scheduled timelines in consultation with others involved in the electronic work

1.5 Effective strategies are formed to ensure solution development and implementation are in accordance with workplace procedures |
| 2 Develop engineering solution for audio electronic problems | 2.1 WHS/OHS risk control measures and workplace procedures for carrying out the electronic work are followed

2.2 Audio electronics circuit device/component operation, characteristics and their application are applied to resolve audio electronic problem

2.3 Parameters, specifications and performance requirements in relation to each audio electronic problem are obtained in accordance with workplace procedures

2.4 Approaches to resolving audio electronic problems are analysed to provide most effective solutions

2.5 Unplanned situations are responded to in accordance with workplace procedures in a manner that minimises risk to personnel and equipment |

	2.6	Quality of work is monitored against performance agreement and/or workplace procedures or professional industry standards
3	Test, document and implement engineering solution for audio electronic problems	
	3.1	Solutions to audio electronic problems are tested to determine their effectiveness and modified, as required
	3.2	Adopted solutions are documented and include instructions for their implementation that incorporates risk control measures to be followed
	3.3	Appropriately competent and qualified person/s required to implement solutions to audio electronic problems are coordinated in accordance with regulatory requirements and workplace policies
	3.4	Justification for solutions used to solve audio electronic problems is documented for inclusion in work/project development records in accordance with professional standards

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

Range is restricted to essential operating conditions and any other variables essential to the work environment.

Non-essential conditions may be found in the UEE Electrotechnology Training Package Companion Volume Implementation Guide.

Developing engineering solutions to audio electronic problems must include the following:

- at least four audio electronic problems

Unit Mapping Information

This unit replaces and is equivalent to UEENEEH149A Develop engineering solutions to audio electronic problems.

Links

Companion Volume implementation guides are found in VETNet - -

<https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=b8a8f136-5421-4ce1-92e0-2b50341431b6>

Assessment Requirements for UEEEC0018 Develop engineering solutions to audio electronic problems

Modification History

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Performance Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all of the requirements of the elements, performance criteria and range of conditions on at least one occasion and include:

- understanding the extent of the audio electronic problem
- forming effective strategies for solution development and implementation
- obtaining audio electronic parameters, specifications and performance requirements appropriate to each problem
- testing and solutions to audio electronic problems
- documenting instruction for implementation of solutions that incorporate risk control measure to be followed
- documenting justification of solutions implemented in accordance with professional standards
- dealing with unplanned events
- applying relevant work health and safety (WHS)/occupational health and safety (OHS) requirements, workplace procedures and practices, including using risk control measures
- applying sustainable energy principles and practices.

Knowledge Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all of the requirements of the elements, performance criteria and range of conditions and include knowledge of:

- audio electronics engineering solutions, safe working practices and relevant standards, codes and regulations, including:
 - acoustics, spatial treatment and sound reproduction:
 - effects of room dimensions, spatial shape and surface textures on acoustics
 - ideal acoustic for specific purposes - speech, solo or small group music, rock music, orchestral music, choral music and cinema
 - measuring room response
 - speaker placement and room response
 - room treatment methods to improve acoustic response

- active methods to improve acoustic response
- audio reproduction and electronic components:
 - preamplifiers amplifier encompassing:
 - function in the reproduction chain
 - typical circuit arrangements
 - power and integrated amplifiers encompassing:
 - function in the reproduction chain
 - typical circuit arrangements
 - graphic equalizers encompassing:
 - function in the reproduction chain
 - typical circuit arrangements
 - component interconnections
- advanced electronic testing and measuring devices and techniques:
 - test/measuring devices and their application - frequency counters, and synthesisers, spectrum analysers, noise and distortion meters and radio frequency (RF) communications service monitor
 - connection of test/measuring devices into a circuit encompassing:
 - safety procedures
 - loading and matching
 - storage and delay
 - circuit arrangement of test/measuring devices
 - taking and interpreting readings
 - notion of decibels, including dBm, dBr, dBu and dBo
- audio system advanced diagnostic techniques:
 - perception and measurement of sound
 - acoustics and equalisation
 - sound recording and reproduction technologies
- audio component testing, measurements and adjustments - frequency response for given loads, small signal test, distortion measurement, noise measurement, frequency versus distortion, intermodulation spectrum, spectral-decay plots, acoustic cross-over, anechoic response, lateral and vertical response
- engineering principles
- relevant manufacturer specifications
- relevant WHS/OHS legislated requirements
- relevant workplace documentation
- relevant workplace policies and procedures.

Assessment Conditions

Assessors must hold credentials specified within the Standards for Registered Training Organisations current at the time of assessment.

Assessment must satisfy the Principles of Assessment and Rules of Evidence and all regulatory requirements included within the Standards for Registered Training Organisations current at the time of assessment

Assessment must occur in suitable workplace operational situations where it is appropriate to do so; where this is not appropriate, assessment must occur in suitable simulated workplace operational situations that replicate workplace conditions.

Assessment processes and techniques must be appropriate to the language, literacy and numeracy requirements of the work being performed and the needs of the candidate.

Resources for assessment must include access to:

- a range of relevant exercises, case studies and/or other simulations
- relevant and appropriate materials, tools, facilities, equipment and personal protective equipment (PPE) currently used in industry
- resources that reflect current industry practices in relation to developing solutions to audio electronic problems
- applicable documentation, including workplace procedures, equipment specifications, regulations, codes of practice and operation manuals.

Links

Companion Volume implementation guides are found in VETNet - -

<https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=b8a8f136-5421-4ce1-92e0-2b50341431b6>